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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.       | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------------|------------------|
| 10/698,558   | 10/31/2003  | J. Christopher Dries | 15436.250.33.1            | 1131             |
| 22913  | 7590        | 09/08/2005           |                           |                  |
| WORKMAN NYDEGGER<br>(F/K/A WORKMAN NYDEGGER & SEELEY)<br>60 EAST SOUTH TEMPLE<br>1000 EAGLE GATE TOWER<br>SALT LAKE CITY, UT 84111 |             |                      | EXAMINER<br>SOHN, SEUNG C |                  |
|  |             |                      | ART UNIT<br>2878          | PAPER NUMBER     |

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/698,558

Applicant(s)

DRIES ET AL.

Examiner

Seung C. Sohn

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because block diagrams (104, 106 and 116 in Fig. 1, 232 in Fig. 2 and 614 in Fig. 6B) should be labeled and the vertical labeling in Fig. 5 has same numbers.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the current mirror in claims 4 and 9 and the current transformer in claims 6 and 11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

Page 13, line 3, "the by the size" should be change to – by the size --.

Page 14, numerous reference numbers are incorrect.

Page 16, Paragraph 046, line 7, "the power supply 612" should be changed to – the power supply 610 --. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. ***Claims 1-7 and 12-20 are rejected under 35 U.S.C. 112, second paragraph,***

as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 1, lines 10-11, the sentence of "wherein the doping thickness product" is not complete. Clarification is required. Regarding claim 12, line 6, it has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense.

Clarification is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. ***Claims 1-6, 8-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vickers (Patent Pub. No. US 2004/0106265 A1) in view of Hofmeister al. (Patent Pub. No. US 2003/0178552 A1).***

Regarding claims 1-6, 8-17 and 19-20, Vickers shows in Figs. 1 & 4b an avalanche photodiode (100) comprising a gain layer (ML); an absorption layer (AL); and a field control layer (CL) disposed between the gain layer and the absorption layer, the field control layer having a doping thickness product that determines a dynamic range and is a product of a density of a dopant and a thickness of the field control layer (Paragraph 0021). Vickers does not disclose a power supply that supplies a range of bias voltages to the avalanche photodiode, wherein the doping thickness product of the field control layer causes the avalanche photodiode to operate in an avalanche region when biased by a bias voltage in the range of bias voltages; and a feedback mechanism that controls the bias voltage in response to the current through the avalanche photodiode. Hofmeister et al. shows in Figs 1 & 2 a power supply (106) that supplies a range of bias voltages to the avalanche photodiode (102), wherein the doping thickness product of the field control layer causes the avalanche photodiode to operate in an avalanche region when biased by a bias voltage in the range of bias voltages; and a

feedback mechanism (108, 208, 210, 212) with a resistor (108) in series with the avalanche photodiode that controls the bias voltage in response to the current through the avalanche photodiode (Paragraphs 0022-0023). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the power supply and the feedback mechanism of Hofmeister et al. for the purpose of achieving better signal to noise ratio.

### ***Allowable Subject Matter***

8. **Claims 7 and 18 would be allowable** if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claims 7 and 18 are allowable because the prior art fails to disclose or make obvious, either singly or in combination, an avalanche photodiode comprising, in addition to the other recited features of the claim, "lowering the doping thickness product lowers a punch-through voltage and raises a breakdown voltage to increase the dynamic range".

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seung C. Sohn whose telephone number is (571) 272-

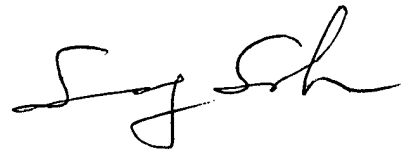
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2446. The examiner can normally be reached on Monday through Friday from 8:30 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seung C. Sohn  
Examiner  
Art Unit 2878

A handwritten signature in black ink, appearing to read 'S. C. Sohn', written in a cursive style.